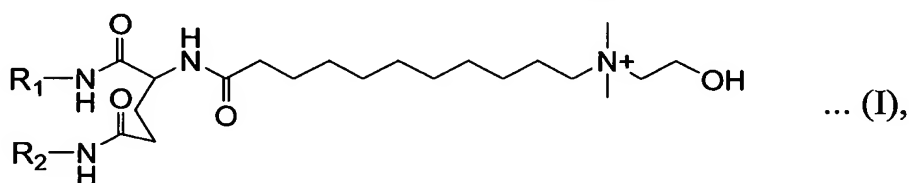


WHAT IS CLAIMED IS:

1. A molecular-oriented polymer gel obtained by self-organizing a self-organizable amphiphilic compound and a monomer interacting with said amphiphilic compound, and then polymerizing said monomer.

5 2. The molecular-oriented polymer gel according to claim 1, wherein said amphiphilic compound is a cation comprising a linear or branched alkyl group having 20 or less carbon atoms.

3. The molecular-oriented polymer gel according to claim 2, wherein said cation is represented by the following general formula (I):



wherein R<sub>1</sub> and R<sub>2</sub> represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different.

4. The molecular-oriented polymer gel according to any one of claims 1 to 3, wherein said monomer is an anionic monomer.

15 5. The molecular-oriented polymer gel according to claim 4, wherein said anionic monomer comprises a sulfonic group.

6. The molecular-oriented polymer gel according to claim 5, wherein said anionic monomer is 2-acrylamide-2-methylpropanesulfonic acid.

20 7. The molecular-oriented polymer gel according to any one of claims 2 to 6, wherein the linear or branched alkyl group of said amphiphilic compound has 10 or less carbon atoms.

8. The molecular-oriented polymer gel according to any one of claims 1 to 3, wherein said monomer is thiophene and/or its derivative, or pyrrole and/or its derivative.

25 9. The molecular-oriented polymer gel according to claim 8, wherein said thiophene derivative is at least one selected from the group consisting of

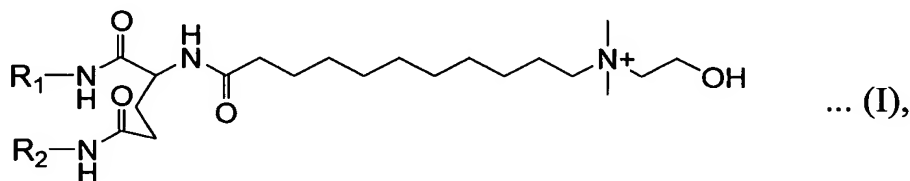
3-thiophencarboxylic acid, 3-thiophenacetic acid, 3-thiophene ethanol, 3,4-ethylenedioxythiophene and bis(thiophene), and wherein said pyrrole derivative is 3-pyrrolecarboxylic acid or 3-pyrroleacetic acid.

10. A molecular-oriented polymer cast film obtained by casting a solution of a self-organizable amphiphilic compound and a monomer interacting with said amphiphilic compound, and then polymerizing said monomer.

11. A molecular-oriented polymer cast film obtained by casting a solution of a self-organizable amphiphilic compound on an electrode, and then supplying current to said electrode in a solution containing a monomer which is thiophene and/or its derivative, or a monomer which is pyrrole and/or its derivative, to electrochemically polymerize said monomer.

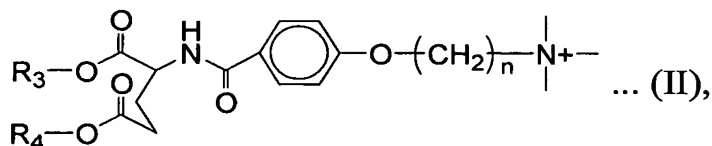
12. The molecular-oriented polymer cast film according to claim 10 or 11, wherein said amphiphilic compound is a cation comprising a linear or branched alkyl group having 20 or less carbon atoms.

13. The molecular-oriented polymer cast film according to claim 12, wherein said cation is represented by the following general formula (I):



wherein R<sub>1</sub> and R<sub>2</sub> represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different.

14. The molecular-oriented polymer cast film according to claim 12, wherein said cation is represented by the following general formula (II):



wherein R<sub>3</sub> and R<sub>4</sub> represent linear or branched alkyl groups having 20 or less carbon atoms, which may be the same or different, and n is an integer of 2 to

12.

15. The molecular-oriented polymer cast film according to any one of claims 10, 12 to 14, wherein said monomer is thiophene and/or its derivative, pyrrole and/or its derivative, or another anionic monomer than said thiophene derivative and said pyrrole derivative.

16. The molecular-oriented polymer cast film according to claim 15, wherein said anionic monomer other than said thiophene derivative is 2-acrylamide-2-methylpropanesulfonic acid.

17. The molecular-oriented polymer cast film according to claim 15, wherein said thiophene derivative is at least one selected from the group consisting of 3-thiophencarboxylic acid, 3-thiophenacetic acid, 3-thiophene ethanol, 3,4-ethylenedioxythiophene and bis(thiophene), and wherein said pyrrole derivative is 3-pyrrolecarboxylic acid or 3-pyrroleacetic acid.

18. A method for producing the molecular-oriented polymer gel recited in any one of claims 1 to 9, comprising the steps of mixing said amphiphilic compound and said monomer to self-organize them, and then polymerizing said monomer.

19. The method for producing a molecular-oriented polymer gel according to claim 18, wherein the polymerization reaction of said monomer is carried out at a temperature lower than a phase transition temperature of a self-organized-to-molecular-level body of said amphiphilic compound and said monomer.

20. A method for producing the molecular-oriented polymer cast film recited in any one of claims 10 to 17, comprising the steps of preparing a solution of said amphiphilic compound and said monomer, casting said solution, and then polymerizing said monomer.

21. A method for producing the molecular-oriented polymer cast film recited in any one of claims 10 to 17, comprising the steps of preparing a

solution of said amphiphilic compound, casting said solution on an electrode, dried said solution to form a film of said amphiphilic compound, immersing said film in a solution comprising said monomer, and supplying current to said electrode to electrochemically polymerize said monomer.

- 5 22. The method for producing a molecular-oriented polymer cast film according to claim 20 or 21, wherein the polymerization reaction of said monomer is carried out at a temperature lower than a phase transition temperature of a self-organized-to-molecular-level body of said amphiphilic compound and said monomer.

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